TRANSCRIPT

# Planting the Seeds for CCSS-M, Part 2

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So, presenting a problem. So, present the problem, understand the concept. This is like using tools, modeling, reasoning abstractly and quantitatively, which is related to mathematical practice. Here: 5+3=8. I see lot of worksheets just like this one, right? And asking students to write 8. First of all, this is not a mathematical expression, and this is not a common language. This is just you can jot down with paper and pencil, but it does not communicate very well because country by country, internationally, it’s very different. However, mathematical expression like “equation” is universal.

So this is the picture, which is concrete. How many fish will there be altogether? So we have 1, 2, 3, 4, 5, and then 3 is about to join. So if you show this one in the block, like semi-concrete like this: 1, 2, 3, 4, 5, and then 3 moving, in action—students say, “Oh, this is addition because increase something,” an add-to situation, right, in the Common Core. So this you can write in 5+3=8, and then 5 fish. Concrete, semi-concrete, abstract, and then bring back to concrete. So this is kind of the modeling process—start from concrete and then model with the manipulatives and then model with mathematical expression, and then do the operation and then once we have got 8, bring it back to the original situation; bring back to concrete.

So another one; concrete situation is cats: 1, 2, 3, 4, 5 cats, and then if you go to semi-concrete, it doesn’t matter if fish or cat, it’s the same, right? And also the abstract is the same. However, 5 cats, the answer is different. So this process is mathematics. Start with concrete, then do the abstract process and then coming back to the concrete. And then sometimes they skip; students write this one and then 5+3=8. So in that case, students say, “I don’t need blocks.” But how this child can show 5+3=8 is reasonable? If you ask students, they may say, “Oh, that’s something I have.” But we should challenge students: “Are you sure?” So how students should do that? “Let me count.” That means let me go back to concrete and then count picture, or let me show this is addition because they are going to use this one. So it’s not always just one way. Students should be able to go back and forth. So that you could justify their solution, which is important part of reasoning, right—reasoning abstractly. This is a mathematical…one of the mathematical practices.

In order to do so, as a teacher, we have to stop telling the student, “You are right” or “You are wrong.” That is something we expect students to do. That is reasoning. Justifying their solution is an important part of mathematical practice. Traditional classroom, we as a teacher, we always justify, but if teachers keep justifying, students heavily rely upon teacher.